Workshop Overview & Framework for Cumulative Risk Assessment

ORD/Regional Cumulative Risk Assessment Workshop

November 4, 2002

Workshop Overview

- Framework for Cumulative RA
- Planning, Scoping, Community Issues
- Approaches to Cumulative RA
- Risk Characterization (Putting it Together)
- Long Term Impacts of Cumulative RA?
- Research Recommendations

Framework Document

- What is it?
- History
- Features
- State of the Science
- Future plans

1. Framework vs. Guidelines

- Framework: General description of the topic. An **information document** laying out scope of the subject and how various parts fit together. (This document)
- Guidelines: Description of how it's done, including **boundaries** (e.g., limits of "good science") not to be exceeded. (Several years away)

Impacts vs. Risks

- **Impacts – harm or adverse effects**
- **Risks – *Probability* of harm or adverse impacts**

Framework Definitions

- **Cumulative Risk:** The combined risks from aggregate [multi-pathway, multi-source, multi-route, over time] exposures to multiple agents or stressors.
- **Cumulative risk assessment:** An analysis, characterization, and possible quantification of the combined risks to health or the environment from multiple agents or stressors.

Key Definition Points

- Multiple stressors or chemicals
- Combined risks
- Can be qualitative

Goal of Cumulative RA

- Using the commonly accepted definition of risk as “probability of harm”, the goal of a cumulative risk assessment is:
  - To address and hopefully answer questions related to the probability of harm, to human health or the environment, from multiple stressors acting together.

When do we do a CRA?

- Cumulative risk assessment is a tool
- It is not appropriate for every task
- Cumulative risk assessments will be most useful in situations where questions need to be addressed concerning the impacts of multiple stressors acting together
- Currently, there are methods limitations

2. History

- Planning & Scoping memo 1997
- Framework started 1999
- 3 external peer involvement meetings 2001
- 2 consultations with EPA's Science Advisory Board 2000, 2001
- External peer review June, 2002
- Plan to publish Framework this year

Types of Issues

- Process issues: Extent of public participation, organization of Framework, etc.
- Technical/scientific issues: Feasibility of certain components, etc.
- Policy issues: Requirements, etc.

Cumulative Risk Assessment

- “Traditional” Risk Assessment:
  - Where we’ve been
- Cumulative Risk Assessment (CRA):
  - Why change?

Some Policy Issues

- Interpreting the definition
- Value added (where/when done?)
- What Agency priority?
- Dealing with Stakeholder fairness
- Defining “acceptable risk”
- Types of stressors/risks included
- Legal issues

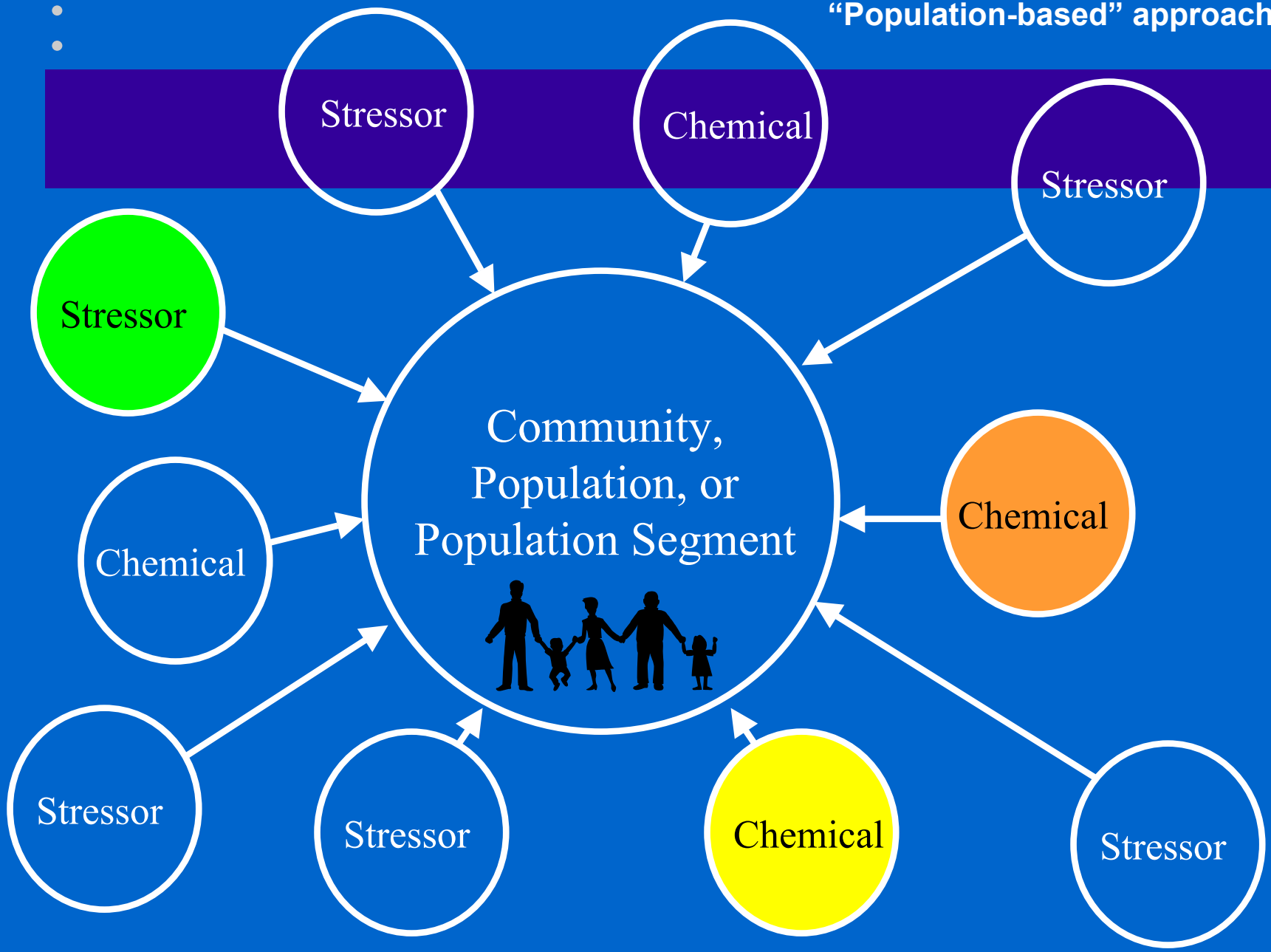
3. Features

- Multiple chemical/stressor
- Non-chemical stressors
- Population focus
- Stakeholder emphasis
- Vulnerability
- Human Health and Ecology
    - May have to assess parts together

Chemical,
Agent, or
Stressor

"Traditional" approach

"Population-based" approach



3. Features

- Multiple chemical/stressor
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Vulnerability

- Susceptibility/Sensitivity
- Differential exposure
- Differential preparedness
- Differential ability to recover

- Question: How do these factors change risk?

3. Features

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- Non-chemical stressors
- Population focus
- Stakeholder emphasis
- Vulnerability
- Human Health and Ecology
    - May have to assess parts together

4. State of the Science

- What do we know about…
  - Adding risks across stressors?
  - Synergism & other interactions?
  - Vulnerability?
  - Non-chemical stressors?
  - Methods to do these assessments?
  - How all these factors change risk?

Combining Different Risks I

- Can (or even *should*) different types of risk be combined?
- Common metric approach
  - Must have “common denominator”

Common Denominators

- Combination toxicology/Combining risk
- Risk factor approach
- Biomarkers or biomonitoring
- Quality Adjusted Life Years (QALYs), Disability Adjusted Life Years (DALYs), Loss of Life Expectancy (LLEs) and other quasi-economic measures

Combining Different Risks II

- Index Approach
  - Keep different risks separate
  - Profiles
- Other: Probability of “Something Bad Happening”

Uncertainty

- Few good examples of uncertainty analysis for Cumulative Risk Assessments
- New GIS-based technology poses new challenges in uncertainty analysis
- What type of analysis would be useful to a decision-maker?

5. Future Plans

- Workshop Report/Research Recommendations to ORD
- Framework published late 2002/early 2003
- Case studies developed 2002-2003
- Issue papers on specific topics 2003
- Work with National Environmental Justice Advisory Committee on Spring 2004 meeting
- Guidelines development *starts* 2003-4